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ABSTRACT

A study of 180 seventh grade students was conducted to discover the relative value of teaching vocabulary by teaching whole words contrasted with teaching prefixes. Two experimental groups and a control group were formed of equal numbers of high, middle, and low ability students based on their scores on the Nelson Reading Test. One experimental group was taught prefixes, whole words, and their meanings. The other experimental group was taught only whole words and their meanings. The control group did free reading during the instruction time of the experimental groups. Each group was given a pretest, a posttest, and a delayed posttest. Both experimental groups did better on the posttest and the delayed posttest than did the control group. The prefix treatment, which took no longer to administer than the whole word treatment, resulted in students learning more prefixes and in their being able to use their knowledge of the prefixes to unlock the meaning of novel words. (TJ)

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A Validated Procedure for Teaching Prefixes and Its Effect on Students' Ability to Assign Meaning to Novel Words

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Because the number of words that a developing reader must learn to deal with is extremely large and because knowledge of roots and affixes gives students generative tools that they can use in unlocking the meanings of thousands of novel words they encounter, the teaching of roots and affixes has been widely advocated (Breen, 1960; Cushenbery, 1972; Dale, 1971; Deighton, 1960; Manzo & Sherk, 1971-1972; O'Rourke, 1974; Stauffer, 1942; Thorndike, 1941). Of the various word elements that might be taught, prefixes would appear to be particularly worth teaching (Stotsky, 1976, 1977). Briefly, the argument that prefixes are particularly

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worth teaching (some of which is given by Stotsky and some of which is our own) is based on three facts. First, there are relatively few prefixes, and many of them are used in a large number of words. Thus, students are not faced with an impossible number of prefixes to learn, and those that they do learn will be widely useful. Second, prefixes tend to have relatively few different meanings, relatively constant meanings, and meanings that are rather concrete and easily definable. Thus, having learned a prefix, students have a rather straightforward and easily applied meaning to work with in dealing with novel words. Third, prefixes tend to have consistent spellings. Thus, having learned a prefix, students are likely to be able to recognize it when it occurs in unknown words.

It therefore appears that teaching prefixes is a worthwhile practice. However, as is the case with many other teaching practices which are widely recommended and that would appear to be worthwhile, empirical results demonstrating the efficacy of the practice are lacking. In particular, detailed descriptions of validated procedures for teaching prefixes and empirical studies which demonstrate the effect of knowledge of prefixes in unlocking the meaning of new words are not available in the published literature. The present paper presents a detailed description of a specific procedure for teaching prefixes and the results of a study demonstrating the effects of this procedure on students' learning of the prefixes taught, their learning of specific words which were taught to illustrate the meaning of the prefixes, and their ability to use their newly learned knowledge of prefixes to unlock the meaning of novel words.

Method

Subjects

Subjects for the study were 180 seventh grade students in a middle to upper middle class suburb of St. Paul, Minnesota. Students were divided into high, middle, and low ability groups based on their scores on the Nelson Reading Test (Nelson, 1962). Grade equivalents of the low ability group ranged from 3.9 to 7.3; those of the middle ability group ranged from 7.4 to 8.9; and those of the high ability group ranged from 9.0 to 10.5. Equal numbers of students at each of the three ability levels were randomly assigned to each of three treatment groups.

Materials

Materials included a 60 item test, instructional materials for a group taught the prefixes, and instructional materials for a group taught whole words.

The test was a four-option, multiple-choice vocabulary test, which was divided into four sections. The first section contained the 9 prefixes that were taught in the study. The second section contained 9 relatively easy words containing the prefixes. The third section contained 30 relatively difficult words that were taught to both the prefix and whole word treatment groups. And the fourth section contained 12 transfer words, difficult words which were not taught but which contained the prefixes that were taught. This test was given as a pretest, a posttest, and a delayed posttest.

The instructional materials for the prefix treatment group included nine transparencies, each of which was used by the participating teachers

to provide direct instruction on one of the prefixes, and three vocabulary worksheets, each of which required the students to use the prefixes being taught in various ways and each of which had the answers listed on the back so that students could correct their own work. Each of the vocabulary worksheets was paired with three of the transparencies, and this combination of a worksheet and three transparencies was used to teach three prefixes and ten words, with one of the prefixes being taught exemplified in four words and the other two each being exemplified in three words.

The instructional materials for the whole word treatment group were similar to those for the prefix treatment group except that prefixes were not taught and the words were ordered in a way that masked the fact that three or four words contained the same prefixes. Three transparencies were used in this treatment. Each of them presented a sentence and a definition for each of ten words, with only two of the words containing the same prefix. Each of these transparencies was paired with one vocabulary worksheet. The vocabulary worksheet paired with each transparency contained the same words as the transparency and required the students to (1) identify the meaning of each word as it was used in the context of a sentence, (2) match each word with its definition in isolation, (3) complete a cloze exercise in which each word was used. Again, answers were listed on the back of each worksheet so that students could correct their own work.

Design and Analysis

The study employed a 3 x 3 x 3 x 4 design with repeated measures on the last two factors. The variables were treatment (teaching prefixes,

teaching whole words, no vocabulary instruction), ability (high, middle, low) test time (pretest, posttest, delayed posttest) and word type (prefixes taught, easy words, words taught, and transfer words). The results were analyzed using the ANOVA and Newman-Keuls procedures.

Procedures

The pretest was given on one day, the treatment on the next three consecutive days, and the posttest on the next day. The delayed posttest was given three weeks later. Both experimental treatments took about 20-25 minutes each day. On each day, subjects in both experimental groups first listened to a short presentation given by the teacher using the overhead projector. In the prefix group, the teacher presented the prefixes and the new words and their meanings. In the whole word group, the teacher presented only the new words and their meanings. Following the teacher presentations, the students were given the worksheets to complete. After they completed the worksheets, students checked their own answers. Students in both groups were allowed to keep their completed worksheets for study.

Students in the control group used the time the experimental groups spent on vocabulary study doing free reading.

Results and Discussion

The results of the study are best seen by considering the interactions, and the first interaction to consider is that between treatment and test time. The treatment x test time interaction was significant, $F(4,342) = 9.12$, $p < .01$. Inspection of the cell means for this interaction

and the results of the Newman-Keuls test show that both the prefix and the whole word treatments produce significantly higher scores ($p<.01$) on the posttest and the delayed posttest than on the pretest but that the scores produced by the no vocabulary treatment do not differ significantly at the three test times. The pretest, posttest, and delayed posttest scores for the prefix group were 72%, 89%, and 87%, respectively; those for the whole word group were 72%, 86%, and 85%, respectively; and those for the no vocabulary group were 70%, 73%, and 74%, respectively. Thus, not only do the prefix and whole word treatments produce significant results at the time of the immediate posttest; those results also hold up for the delayed posttest, which was given three weeks later.

At this point, it is clear that both the prefix and the whole word treatments produce greater gains than no vocabulary instruction, but there has been no evidence presented indicating that either of these two effective treatments is superior to the other. However, such evidence may be found by considering the treatment x test time x word type interaction, which was significant, $F(12,1026) = 5.43067$, $p<.01$, and some of the cell means for this interaction. The important cell means to consider here are those for the two experimental treatments, with prefixes taught, words taught and transfer words, and at both the posttest and the delayed posttest. For words taught, the scores of the whole word group were slightly better than those of the prefix group on both the posttest (91% versus 87%) and the delayed posttest (88% versus 87%); however, results of the Newman-Keuls test indicated that neither of these differences were significant. On the other hand, for prefixes taught and for transfer

words, the scores of the prefix group were higher than those of the whole word group on both the posttest and the delayed posttest. The means for the prefix group versus the whole word group for prefixes taught were 87% and 76% on the posttest and 84% and 78% on the delayed posttest. The means for the prefix group versus the whole word group for transfer words were 81% and 73% on the posttest and 81% and 72% on the delayed posttest. The Newman-Keuls test indicated that all of these differences were significant ($p<.01$). Thus, the prefix treatment, which took no longer to administer than the whole word treatment resulted in students learning the words taught just as they did with the whole word treatment but also resulted in students learning more prefixes than the students in the whole word treatment and in their being able to use their knowledge of these prefixes to unlock the meaning of novel words.

One final outcome of the analysis should perhaps be noted. In no case is an interaction involving ability and treatment significant at $p \leq .01$. This fact, coupled with inspection of a variety of cell means, indicates that students at all ability levels can learn prefixes and can use their knowledge of prefixes to unlock the meaning of novel words. For example, high ability students produced 18% more correct responses on the prefixes and 17% more correct responses on the transfer words on the posttest than on the pretest; and low ability students produced 20% more correct responses on the prefixes and 28% more correct responses on the transfer words on the posttest than on the pretest.

The major conclusions of the study can be stated very briefly. Prefixes can be taught, and they can be taught to both higher and lower

ability students. Moreover, using the procedure employed in this study, teaching prefixes and words, takes no longer than merely teaching words. Finally, students can use their knowledge of the prefixes they are taught as a generative tool which will help them unlock the meaning of novel words.

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